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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/717,419	11/19/2003	Koji Segawa	16CT02147	7775

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EXAMINER
HO, ALLEN C

ART UNIT	PAPER NUMBER
2882	

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DATE MAILED: 05/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/717,419	SEGAWA ET AL.	
	Examiner	Art Unit	
	Allen C. Ho	2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 November 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,7-11 and 13-16* is/are rejected.

7)☒ Claim(s) *6 and 12* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 November 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *112003*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 2, 7, 8, 13, and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Williams *et al.* (U. S. Patent No. 5,485,494).

With regard to claim 1, Williams *et al.* disclosed an x-ray controlling method for an x-ray imaging apparatus for projecting x-rays from an x-ray tube (**13**) onto a subject (**15**) to be imaged and detecting transmitted x-rays, and producing an image based on detected x-ray signals, comprising the steps of: setting an upper limit of an x-ray exposure dose to the subject to be imaged; and modulating the tube current (mA) of the x-ray tube so that the exposure dose does not exceed the upper limit (column 4, lines 33-45).

With regard to claim 2, Williams *et al.* disclosed the x-ray controlling method of claim 1, wherein the x-ray imaging apparatus is an x-ray CT apparatus (**10**).

With regard to claim 7, Williams *et al.* disclosed an x-ray imaging apparatus comprising: a setting device (**26**) for setting an upper limit of an x-ray exposure dose to the subject to be imaged (column 3, lines 33-53); and a modulating device (**22**) for modulating the tube current of the x-ray tube so that the exposure dose does not exceed the upper limit.

With regard to claim 8, Williams *et al.* disclosed the x-ray imaging apparatus of claim 7, wherein the x-ray imaging apparatus is an x-ray CT apparatus (**10**).

With regard to claim 13, Williams *et al.* disclosed an x-ray imaging apparatus comprising: a calculating device (**26**); and a display (**32**).

With regard to claim 16, Williams *et al.* disclosed the x-ray imaging apparatus of claim 13, wherein the x-ray imaging apparatus is an x-ray CT apparatus (**10**).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 3 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Williams *et al.* (U. S. Patent No. 5,485,494) as applied to claims 2 and 8 above, and further in view of Suzuki *et al.* (U. S. Patent No. 6,590,953 B2).

With regard to claims 3 and 9, Williams *et al.* disclosed the x-ray controlling method of claim 2 and the x-ray imaging apparatus of claim 7. However, Williams *et al.* failed to disclose the x-ray CT apparatus conducts imaging by a helical scan.

Suzuki *et al.* taught helical CT enables a substantial reduction in the time required to perform a three-dimensional CT imaging by continuously rotating the x-ray tube and the x-ray detector around a subject while moving a table on which the subject is placed (column 1, lines 31-37).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to perform helical CT scans, since a person would be motivated to reduce the time required to perform a three-dimensional CT imaging of a large target volume.

5. Claims 4, 5, 10, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Williams *et al.* (U. S. Patent No. 5,485,494) as applied to claims 2 and 8 above, and further in view of Eisenberg *et al.* (U. S. Pub. No. 2003/0128801 A1).

With regard to claims 4 and 10, Williams *et al.* disclosed the x-ray controlling method of claim 2 and the x-ray imaging apparatus of claim 8. However, Williams *et al.* failed to teach that the modulating device finds an exposure dose predicted value based on an imaging protocol, and modifies the tube current set value in the imaging protocol when the predicted value exceeds the upper limit.

Eisenberg *et al.* disclosed a modulating device (**44**) that determines an exposure dose predicted value based on an imaging protocol (paragraph [0112], lines 12-16).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to find an exposure dose predicted value based on an imaging protocol, since a person would be motivated to prevent subjecting a patient to excessive radiation exposure by comparing a calculated dose with the upper limit before proceeding with the actual imaging protocol.

Furthermore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the tube current set value in the imaging protocol when the predicted value exceeds the upper limit, since a person would be motivated to prevent subjecting a patient to excessive radiation exposure.

With regard to claims 5 and 11, Williams *et al.* in combination with Eisenberg *et al.* disclosed the x-ray controlling method of claim 4 and the x-ray imaging apparatus of claim 10, wherein the tube current set value is specified for each slice position (Williams *et al.*, column 4, lines 21-24).

6. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Williams *et al.* (U. S. Patent No. 5,485,494) as applied to claim 13 above, and further in view of Tsoulfanidis.

With regard to claim 14, Williams *et al.* disclosed the x-ray imaging apparatus of claim 13. However, Williams *et al.* failed to teach that the calculating device calculates the exposure dose based on historical imaging data for the subject to be imaged.

Tsoulfanidis disclosed Code of Federal Regulations (10 CFR 20) that establishes radiation exposure limits for nonstochastic and stochastic effects (p. 567-570). Table 16.9 lists various maximum exposure limits on a yearly basis.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to program the calculating device to calculate the exposure dose based on historical imaging data for the subject, since a person would be motivated to avoid exceeding the maximum radiation exposure limits as provided in the Code of Federal Regulations (10 CFR 20).

7. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Williams *et al.* (U. S. Patent No. 5,485,494) and Tsoulfanidis as applied to claim 14 above, and further in view of Herzog (U. S. Patent No. 6,241,668 B1).

With regard to claim 15, Williams *et al.* in combination with Tsoulfanidis disclosed the x-ray imaging apparatus of claim 14. However, Williams *et al.* and Tsoulfanidis failed to teach that the calculating device acquires the historical imaging data from a server.

Herzog disclosed an x-ray imaging apparatus (**1**) that comprises a calculating device (**5**) connected to a patient data server (**12**) over a network.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide a patient's historical imaging data on a server, since a person would be motivated to make the data available to a plurality of clients simultaneously.

Allowable Subject Matter

8. Claims 6 and 12 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allen C. Ho whose telephone number is (571) 272-2491. The examiner can normally be reached on Monday - Friday from 8:00 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward J. Glick can be reached at (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Allen C. Ho

Allen C. Ho
Primary Examiner
Art Unit 2882

13 May 2005